THE ROLE OF THE PHYSICAL ENVIRONMENT IN ENACTING SCHOOL CHANGE

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Abstract

School leaders are frequently involved in attempting to make changes within their institutions, but educational change is known to be challenging. The extensive literature relating to school level change, both policy led and driven by within-school initiatives, shows some awareness of the part played by the physical school environment. Yet, the role of the school premises in change is rarely the focus of research rooted within this literature.

This is a notable omission. The history of innovation in school design, in the UK and elsewhere, parallels the recognised challenges of school reform and other change. Educational leadership and management practice suggests awareness of how the physical environment may encourage or constrain, and so has the potential to be an important part of a change process. This understanding is not developed, however, with little analysis of how and why change occurs, or fails to occur, which would assist educational leaders in innovating.

This paper brings together our research in school environments and our work with schools attempting pedagogical change to develop such an understanding of the place of the physical setting in initiating, supporting and sustaining school level change. We use the framework adopted by Priestley of considering culture, structure and agency within school, where the physical environment is part of the structure within which change is attempted. It becomes clear that although the physical setting is intimately related to other school structures, particularly certain organisational features, there is something different about the way the physical setting, as a tangible and visible entity, contributes to change processes.

Introduction

Change in schools

Educational change is known to be challenging (see e.g. Fullan, 2007; Tyack &Tobin, 1994). There is an extensive research literature relating to school level change, both policy led (e.g. Priestley, 2011; Hargreaves, 2002) and driven by within-school initiatives (e.g. Thomson et al., 2009). The consistent finding is that change is hard, time-consuming and frequently fails to occur: the ‘paradox of innovation without change’ (Priestley et al., 2011: 266). As Thomson concludes from her review of this area: ‘Whole school change is elusive in practice and in the literatures’ (Thomson 2007:10).

Various conceptions of school organisation and change processes have been proposed to explain observed events and to guide school leaders and others in enacting successful change. Fullan has charted successful change and draws attention to the stages of change (initiation, implementation and institutionalisation), providing a useful way to divide up and examine a change in progress, but perhaps less clarity on why and how change attempts succeed or fail. His three elements of successful school reform, being embedded in school structures, having a critical mass
of school staff trained and committed, and having a procedure for continued support (Fullan, 2007:102) leave open how these situations are achieved.

Relating to Fullan's observation about training and the commitment of a critical mass of staff, educationalists have noted the importance of practitioner action as opposed to only a policy-level instruction, and much has been written about the relationship between policy and practice (e.g. Hargreaves, 2002; Pollard, 1985). Yet, Priestley argues that we need to move beyond this dichotomy, which encourages a simplistic view of policy as 'something monolithic' (Priestley, 2011: 6) and tends to position teachers as either 'barriers' or 'agents of change' (Priestley, 2011: 2). He argues for the need to understand the detail of the situation in sociological terms, but his framework of culture, structure and agency draws particularly on the work of Archer (e.g. 2000). The resulting conceptualisation, he proposes, 'allows us to disentangle the various aspects that contribute to the unfolding of a given social situation, enabling us to make judgments about the relative causative weight of culture, structure and agency' (Priestley, 2011: 7). That is what we attempt below, using this framework to consider three cases of attempted change that involved alterations to the physical school setting, but first it is necessary to introduce some background understanding about the physical learning environment.

Physical space, education and change
As has been discussed elsewhere by a number of scholars, the evidence base relating to the absolute impact of the physical setting on learning is complex (Gislason, 2010; Woolner et al, 2007; Weinstein, 1979). Although the physical environment does not determine educational activities, there is evidence of a relationship between school setting and the activities that take place there (Horne-Martin 1999; 2002) and research tends to suggest that different settings facilitate some pedagogical and social practices while hindering others. For example, in classrooms organised in a traditional manner, there tends to be a more teacher-centred approach to learning with less student collaboration (Sigurðardóttir & Hjartson, 2011). This relationship of the school environment to practices has suggested to some educators and school leaders that changing the physical setting is an effective way of initiating or supporting change (e.g. Briggs, 2001). Yet the results of such environmentally-led change are mixed. Sometimes changes to the physical setting facilitate other development (Uline et al., 2009), but classroom space can be changed quite dramatically without much resulting change in pedagogical practices (Bennett et al., 1980).

Thus innovation linked to physical school space can demonstrate Priestley's 'paradox of innovation without change', although on other occasions it seems supportive or even catalytic. It seems important to understand how these different outcomes occur. However, the school change research literature tends not to focus on the role of the school premises in change. This is despite such research showing some awareness of the involvement of the physical school environment, as when Priestley reports a case where the layout of classrooms facilitated the interaction of two key teachers. He comments that pedagogical practices are 'often a practical response to the spatial characteristics of the school' (2011: 14), but this aspect is not further developed. In contrast, some studies where the focus is more concertedly on the school setting (e.g. Frelin & Grannas, 2014; Gislason, 2015) may report the results of change or improvement with less explanation attempted of how the change was enacted. Therefore the intention of this paper is to fill this gap. We will first consider the potential of the physical school environment in setting change in motion (initiation, in Fullan's terms), but then, bearing in mind the importance and difficulty of getting beyond this stage, we investigate how physical settings can support and sustain change. We do this through
examining three cases of attempted change in UK schools, and use Priestley's framework in order to explore the role of structure, culture and agency.

**Physical space as the initiator of change**

The benefits of reflection on practice are well established: in education and beyond, the 'reflective practitioner' is recognised as desirable (Schön, 1983), and being reflective can initiate constructive and appropriate improvement. In a study of carpet space use within a school (McCarter and Woolner, 2011) one striking finding was how quite simple feedback from pupils about their experience of this classroom space provoked a teacher to reconsider her practice. She made alterations both to her way of using the space, but also to certain physical elements, such as replacing her chair with a low stool. In considering this study together with some other work consulting school users about their premises (Woolner et al., 2012a) we proposed that the physical environment might be a particularly good place to begin reflection on existing practice, since the setting is a visible and concrete manifestation of taken for granted ideas and ways of doing things. An extension of this approach uses photographs of other settings as a way for groups of teachers and students to talk together about their aims or ideals for teaching and learning. An on-going project with a local school has taken the physical learning environment as a starting point in this way with the intention of beginning a process of change that the head teacher envisages as involving school practices and culture, not just space.

It seems clear that a consideration of the physical setting can be a useful part of initiating change, sometimes as an instance of small-scale individual reflection but also as an aspect of larger scale, whole school innovation. This might be understood as using an examination of particular structural features of the existing school (the built environment, but also linked structural elements such as school rules, timetabling and curriculum) to either enable individual agency or to begin a process of cultural change at the school level. It is worth questioning the functionality of proceeding in quite this way, given what is known about change enacted mainly at the structural level, which research suggests is rarely sufficient (Priestley, 2011; Gordon & Patterson, 2008). For example, Priestley describes relatively superficial structural changes intended to facilitate curriculum innovation but limited by prioritising ‘externally visible structures rather than addressing underlying practices’ and making changes that are ‘viewed in largely organizational rather than pedagogic terms’ (Priestley, 2011: 13). Similarly, Szczesiul and Huizenga criticize two schools they studied that ‘created structures ... [to support the desired change in teacher behaviour]...but failed to create a cultural context that would bolster teacher efficacy and motivation’ (2014: 184). Our suggestion is that through using the important structure of the physical setting in a careful manner as part of a bigger process, change can be initiated that goes beyond mere structure. Our more detailed discussion of three cases through later phases of change processes will enable us to develop this suggested understanding.

**Three cases of change**

**Open Futures at Southside School**

Southside Primary School is predominantly two form entry with 420 pupils on roll (2013-14). It is located in a city in the north east of England that has seen a trend of de-industrialisation and rising unemployment over the last decades. The ward served by the school is in the top 5% most deprived areas of the UK, as is the wider city, and generally around half the students are eligible for Free School Meals (FSM). Pupil Mobility is around 23%, which is above both local authority (LA) and national averages and in the past six to seven years the school has experienced a
dramatic increase in the number of pupils for whom English is an Additional Language (EAL), with 23 languages now spoken in school and EAL pupils comprising around 18% of the total.

In September 2011, Southside began two years of initial training and development as part of the Open Futures programme. Open Futures is a skills and enquiry based learning programme (http://www.openfutures.info/index.htm) for primary schools, which intends to facilitate change in pedagogy and curriculum. There are four integrated strands: growit; cookit; filmit; and askit (Philosophy for Children). The school had previous gardening experience through connections with the RHS, but had little or no history of using the other strands as vehicles for learning. In deciding to get involved with Open Futures, Southside committed itself to the two years of supported development, which included making a financial contribution to the costs of training. The additional commitment of staff time and inclusion within school planning came under some pressure when Southside was inspected in September 2012 by the UK’s Ofsted service and it was judged that the school ‘requires improvement’.

The head teacher was excited by Open Futures as a means through which the school could widen their curriculum, providing a range of new and engaging experiences for pupils. The school particularly valued the opportunity to increase pupils’ knowledge of the world and develop skills with real life application and purpose; it was anticipated that this would result in a more engaging curriculum that would excite pupils’ curiosity and motivate learning. The intention was that by drawing on the training and on-going support offered, teachers would be able to use the four strands as a basis for planning the curriculum and develop clear progression of skills. It was hoped that, in time, this would result in increases in attainment, as required by Ofsted, and the development of independent learning skills that could be applied across the curriculum and beyond.

Supporting change

In common with the other schools involved in the programme, Open Futures at Southside acted as a catalyst for immediate tangible changes that the school was intending or aspiring to make in curriculum content, development of physical space, enterprise and community links. This was seen in the finding and organising of physical space for the programme, new topics added to the curriculum to build links between strands and with existing content, and open days to showcase gardening and involve parents. Strand leads were appointed for each strand. The head teacher also ensured that Open Futures was on the agenda for school and governors meetings, and adapted budgets and staff deployment to accommodate and resource the programme.

Growing areas were extended and developed throughout the school grounds, enabling easy access for all classes and planting in tyres and pots to maximise the use of space and ensure high visibility. Southside developed an existing mobile classroom into a cooking space with adjoining classroom, and space was found for filimit, in a classroom now devoted to filimit and music, allowing easy access to resources and additional space for activities.

Southside staff got involved in the programme as a school initiative. There was some pre-existing knowledge among staff members but this was diverse and not integrated. Although some had prior experience or skills in a particular strand, many did not and were reliant on the Open Futures training to up-skill themselves as well as learning specific teaching techniques relevant to the strands.
Both pupils and staff were enthusiastic about Open Futures. Pupils commented that they value learning new skills that they can then use at home and in the future, as well as appreciating the strands as ‘fun’, ‘exciting’, ‘different’ and ‘messy’. In terms of enjoyment pupils rated cookit and filmit particularly highly. Staff believe that this enjoyment is significant in engaging children in learning and report that behaviour is particularly good during Open Futures sessions. As anticipated, the Open Futures activities provided a context for other learning:

*What we do know is that it tends to be the Open Futures things that children remember having done you know, so if you say to them you know we were talking about gasses and you say to them remember when we did that and it’s the yeast activity in the cookery room they tend to remember* (head teacher).

It appears that the integration of diverse skills and experiences can enhance the transfer of understanding between situations, but this seems to happen initially because of explicit linking of strand and curriculum knowledge and skills. In a questionnaire comment, made in Spring of the second year of the programme, a Southside teacher explained that s/he was involved in the following curriculum development:

*Plan strands into the yr 2 curriculum. Try to fit NC & OF into a timetable. Each term we try to incorporate each strand into the topic.*

Over time, however, the links between the elements of Open Future and with the wider school curriculum have become more seamless, although there are still recognisable Open Futures activities, often taking place in the explicitly Open Futures spaces as described above.

**Sustaining change**

After two school years involved in the Open Futures programme a number of changes had occurred at Southside. The integration and mutual dependence of these developments, together with the evident enthusiasm of the head teacher and other staff, suggested to us that these were indeed signs of a deeply embedded change in pedagogy and culture.

When school level test results showed small, but positive, change the head was cautious, proposing that there could be a link between raised attainment and the programme. She was further convinced of the efficacy of Open Futures because, as she pointed out, implementing such a programme may in the short term put outcomes under pressure:

*…for attendance to make slight gains and for attainment as measured in SATs etc to hold steady at a time of curriculum change, i.e the implementation of O.F strands, is in itself noteworthy because change which involves everyone learning new skills and finding ways to include them across the curriculum could have been a disruption that caused a dip in these measures until it became embedded in practice. I think that it is a tribute to the quality of the training and to the staff of all the schools that this did not happen.* (Head teacher, email, 27.1.14)

This suggests change within practices and understanding at Southside, but it is evident that these more intangible developments are bolstered by embedded changes to curriculum, staff training and the school environment. For example, training of Southside staff in askit ensures that this strand is an integral part of learning from Foundation Stage through to Year 6. The physical environment is also important to the school’s development of askit, since, in addition to developing skills and exploring topics in lessons, pupils are encouraged to use the ‘wonder tree’ as a means through which they can ask their own questions and offer answers across the school. This has proved to be a popular resource, facilitating reflections and conversations across year groups.

Overall, Southside is committed to Open Futures as a permanent part of the school curriculum and life; it is convinced of the benefits in providing a context and purpose for learning, together with the
skills necessary for independent enquiry, and believes that pupils are making good progress towards these aims.

Achieving 'Institutionalisation'?

It is worth reviewing how this change occurred. We observed initial physical alterations and organisational changes becoming established, being further developed, and helping to embed Open Futures activities in the life of the school. Over time, Open Futures became less explicitly referenced in school planning, because it was so accepted and is firmly rooted in protected budgets and staffing. During the later interview and in subsequent email communication, the Southside head teacher described how the changes due to the programme enable better learning processes and teaching practices to continue to develop.

Staff professional development through Open Futures enabled teachers at Southside and the other schools to make the strands and activities their own. Open Futures tends to embed collaborative practices between staff members, enhancing curriculum coherence and pastoral care across the school. As seen at Southside, once Open Futures is established, there is on-going, mutually dependent development of curriculum, organisation and space. In this and other ways, Open Futures strands are integrated with the wider curriculum and this integration is embedded in physical space, particular activities and ways of learning.

It may at first appear that innovation through Open Futures is enacted mainly at the structural level, which, as discussed above, is rarely sufficient to bring about real change. However, we would like to argue that, contrary to a cursory view, detailed examination of the change process at Southside, and other Open Futures schools, reveals changes at the levels of individual agency and culture, in addition to the many structural changes described above. The Open Futures support and community provides a culture within which school staff can situate and understand the structural changes. The distinctiveness of this culture from the prevailing culture in English education appears to enhance the agency of school leaders, as demonstrated by the Southside head teacher. Meanwhile, the practical development of the programme which depends on devolving responsibility to staff, tends to enable individual agency thus allowing staff to make progress with their part of the programme. This can be seen, for example, through the allocation of strand leadership roles to staff, mainly teachers, and in increased involvement of teaching assistants in developing specific strands.

Open Futures at Southside School has provided us with an example of innovation which was extremely successful as a result of change at a structural, cultural and individual level. In order to explore this idea further we now turn to two schools which have experienced much more mixed results in the change process.

Enquiry based learning at Green Hills School

Green Hills School is a non-selective secondary school of approximately 1000 students, aged 11-16 years, formed by the recent merger of two schools that had formerly used separate buildings on a shared site, with a new school building under construction at the time of our research. The school is located in an area of north east England which has lost much traditional employment, producing concerns that students lose motivation and develop limited aspirations as a result of poor employment prospects. Due to this post-industrial situation the local population is steady or decreasing and the school competes for its intake with a number of other secondary schools. School leaders therefore felt the need to establish the school as distinctive. In considering how to do this while meeting the needs of the students, the head teacher and other senior staff were
preoccupied by decreasing achievement within the lower school years that would translate into lower attainment at GCSE in a few years if no changes were made to pedagogical practices. As well as failing these students, such reductions in GCSE results could prove disastrous for the school given the current UK climate of league tables of exam results and the encouragement of parents to choose schools on this basis.

The response of the senior management team was to review the school curriculum, and begin a transition to learning which emphasised skills and competencies as well as content knowledge, through the development of ‘enquiry’ based learning. This approach encourages greater student autonomy and independence – characteristics that the teachers felt the students were lacking.

Supporting change

It was anticipated that the new school building would actively support, rather than hinder, this style of learning, giving students more autonomy through the provision of shared space. The intention was that interdisciplinary, enquiry-based learning facilitated by flexible use of bigger spaces and teams of teachers would replace traditional teaching of separate school subjects by one teacher in an enclosed classroom with classes of 25 to 30 students. This change in practice was intended to be built on organisational change where existing school 'departments' were to be combined into five new 'faculties', bringing together related disciplines such as maths and science, pulling together previously more disparate subject knowledge and encouraging more interdisciplinary working among staff. In essence, the school leaders were hoping to change the culture of the school through making alterations to tangible structural aspects such as department organisation, curriculum and, importantly, the physical space.

The plan was for the organisational change to the new faculties, and so to more interdisciplinary working, to happen from September 2011, a full year before the move into the new building. During the year before this reorganisation into faculties, it was intended that a transition in practices and pedagogical understanding was to begin. More enquiry based learning would be planned and attempted, specifically in response to an 'experimental week', which took place in the middle of that school year (in February 2011).

This experimental week of enquiry based learning was conducted by teams of teachers with a large group of students (approximately 80 Year 8 pupils, aged 12-13 years) in an existing open space. During the week, teaching staff worked across existing departments within the new faculties, with each faculty having responsibility for arranging enquiry based learning relating to their disciplines for one day of the week. The curriculum was organised around a main theme of a local landmark bridge. The students were chosen by senior teachers in collaboration with form tutors and subject teachers to represent students’ full ability range, but the school leaders decided to exclude students whose behaviour might be challenging or difficult. The teachers’ involvement was broadly voluntary and discussion with them revealed a range of views. Although some got involved in the experimental week because they were particularly enthusiastic about the new approach, others had considerable misgivings.

We were engaged to facilitate the teachers’ reflections on learning and teaching as they prepared for the week and as they considered the experience afterwards. Our research interest centred on the experience of both the teachers and students during the week, and how this related to their understandings of learning and teaching before and afterwards. We have previously discussed the student perspectives on education and how these relate to the attempted change (Woolner et al., 2012b) and have also written about the mixed views of the teaching staff, the intentions of the
school management and how this played out in the UK context of school inspections and league tables (Woolner et al., 2014). However, it is worth considering again the nature of the changes that were put in place and questioning why the innovation failed to spread through the culture and practices of the school as the school leaders intended.

Sustaining change?

Some distinct structural changes were implemented. In addition to the new building with its open, flexible learning spaces, there was the reorganisation into faculties and the intended revising of the curriculum to enable enquiry based learning. The new faculties could have been expected to encourage the sorts of cross-disciplinary approaches that are vital for the version of enquiry based learning that the leadership team envisaged. Once this was under way, the timeline intended by the school leaders would have seen the new building's layout, with each faculty in its own space, further embed collegiality. However, during our involvement in the year of the preliminary experimental week, we became concerned that insufficient time was being allowed for the staff to undertake the planning necessary to develop these new parts of the curriculum in a cross-disciplinary way. The need for time for collaborative planning was a consistent call across the teachers who were involved in the experimental week. In addition, and not unexpectedly, there were some concerns amongst both teachers and students about how the new learning practices would work: could content be covered? Would students be adequately prepared for public exams?

We were not able to continue to be directly involved at Green Hills School into the next two years of their change process, but followed the story through a series of very critical Ofsted reports. It would appear that the revolution in educational culture had not occurred. Although the new building seems to have produced an immediate raising of staff and student morale, the inspection reports suggest that any positive impact on learning and teaching practices was brief: by the time of the second report within the first year of the new building, the problems of poor student behaviour and inconsistencies in staff responses were again dominating the criticisms of Ofsted. The only subsequent mention of the new premises was to draw attention to the challenges of the open space, with Ofsted suggesting that walls might need to be built to reduce noise problems. It would appear that rather than embedding changed educational practices, the new space was simply making traditional practices more awkward.

In other words, the school had ended up with only an isolated structural change, which was therefore doomed. This had happened despite the intentions that the school leaders undoubtedly had of enacting cultural change and their hopes that the experimental week would enhance teacher agency through enabling them to develop their own practices to facilitate enquiry based learning. The cultural change appears to have been thwarted by more powerful cultural forces from outside the school (this argument is developed in Woolner et al., 2014) as well as by insufficient time being given to its development amongst the staff. It was particularly unfortunate that the school leaders’ intention of teachers having the freedom to make the new practices their own was interpreted by some staff as a lack of senior management interest. Also a number of staff exercised agency by leaving the school to get jobs in schools with a more traditional, content-led approach.

Building Learning Power and Project-Based Learning at Castle View Academy

Castle View Academy is a larger than average secondary school in the north east of England. The school operates on two sites which are two miles apart. One of the sites houses the Key Stage 3 pupils (aged 11-14) and the other the Key Stage 4 pupils and sixth form (aged 14-18). Many of the teachers travel between both schools over the course of a school week. The school has a below
average number of pupils of an ethnic minority, on free school meals or with special educational needs (SEN).

In 2006 the school began experimenting with enquiry-based learning in order to provide the students with an engaging curriculum that would also connect them to their local area. The initial impetus for this experimentation came from the deputy head teacher who felt that the poor behaviour being exhibited by many of the pupils was the result of emotional immaturity and a lack of interest in learning. Her decision to research a range of curricula coincided with radical changes to the Key Stage 3 curriculum introduced by the UK government. This included the abolition of the end of Key Stage 3 national test and a renewed focus on creativity.

The deputy head was determined to develop a sustainable vision for the school and to that end she set up a working group which any members of staff could join. Seventeen took part, representing every faculty and a range of teaching experience. The group started with an initial research question: What kind of children do we want and how do we get this? The staff visited schools around the country that were putting a variety of different approaches into practice and finally settled on the Building Learning Power (BLP) programme developed by Guy Claxton. This focuses on ‘creating a culture in classrooms - and in the school more widely - that systematically cultivates habits and attitudes that enable young people to face difficulty and uncertainty calmly, confidently and creatively’ (http://www.buildinglearningpower.co.uk/ ). The school created a bespoke cross-curricular programme (history, geography, RE, design and technology and art) which they called ‘Inspiring Minds’ and which consists of nine hours of curriculum time. This introduces the pupils to the habits of mind, collaborative working, research, reflection and the language of learning.

**Supporting change**

In order to create a workable model for introducing the Inspiring Minds programme, it was initially introduced to the Year 7 pupils in 2006/7. Then in 2008/9 the key principles which underpin the programme (i.e. the habits of mind etc.) were incorporated into the lessons of the remaining year groups, including the sixth form. All of the teachers are expected to plan and teach the content of their subjects in ways that reflect the values and skills that the programme promotes.

As well as the structural changes made to the curriculum and the timetable, the Senior Leadership team also encouraged the teachers to rearrange the furniture in the classrooms so that collaboration between the pupils would be facilitated. Circular tables were purchased for some classrooms and in others the teachers created L or U shapes or grouped two tables together. Pupils were expected to sit facing one another so that they learn from each other as well as the teachers.

**Sustaining Change**

The Head teacher and senior leadership team all promote the ethos of the school and the BLP programme and the teachers are supported to both understand and deliver the approach through a comprehensive structured programme of CPD which includes residential and coaching. Sharing good practice is also encouraged through the creation of an open-door policy whereby teachers can observe one another’s teaching. Promotion structures have also been linked to the ability of teachers to model good learning and enact the principles of BLP. Arrangement of classroom furniture has continued to be used to facilitate the collaborative learning that is desired. Tables in rows are not allowed and the classrooms are monitored to ensure that this does not occur. The
rationale for this is that tables in rows would represent a teacher who does not embody the values and vision of the school.

In 2013 the school started working with staff from High-Tech High in San Diego, USA and the Innovation Unit to introduce and develop Project-Based Learning (PBL). With its focus on cross-curricular projects that promote reflection, critique and producing high-quality work for an audience that includes the community, project-based learning seemed a natural step for the school to take and one that fitted in with the BLP programme already in place. The staff embraced the principles of PBL, including the concept of collaborative planning which the High Tech High teachers introduced (e.g. project tuning). A series of projects was developed, including both cross-curricular and within subject projects, in every year group. However the development of project-based learning has suffered a series of setbacks in recent months. The reasons for this include: the departure of a key member of staff with responsibility for its development within the school, the introduction of the new secondary curriculum which will require more time for teaching subject content and finally the physical space of the school which does not facilitate PBL approaches.

In terms of the physical space although there are large rooms that can accommodate end of project exhibitions (the dining hall and theatre), the actual classrooms and split site do not make the development stages of projects easy. Teachers in the school do not have their own classrooms, rather they teach in four to five rooms often across the two school sites. As a consequence they do not have ownership over the teaching spaces and cannot create the type of areas needed to allow the pupils to work independently on a variety of activities (i.e. areas for research, computer areas, craft areas). Collaboration between the staff is also impeded by the fact that each subject area has its own office (i.e. a Maths Department office, an English Department office) and this is where the teachers do their planning and spend most of their breaks and lunchtimes. This limits the potential for cross-curricular team work.

Achieving ‘Institutionalisation’

However, having experienced the increased engagement of the pupils who take part in project-based learning as well as the improved quality of their work, the senior leadership team are determined to put structures in place that will enable the staff to feel confident to teach projects at key points in the year. This process has begun with the creation of a weekly programme of CPD that will address the key issues e.g. critique, project tuning, planning a project etc. Crucially the programme will involve teachers from partner schools who are also developing this approach. This will encourage the sharing of good practice and provide a space, organisationally and physically, to discuss the challenges being faced.

Although not an initial driver of the changes the school has made, the physical environment has facilitated and supported the changes in classroom and curricular practices achieved over the last decade. However, it would appear that aspects of school space are hindering further development. In particular, subject specific offices are making cross-curricular planning more difficult and causing other contact between subject teachers to be infrequent. It could be argued that this physical limitation is impacting on further structural developments, such as curriculum developments, but also affecting development of an appropriate culture of education at Castle View. In addition, the issues around classroom arrangement and ownership can be interpreted as hindering the agency of individual teachers to develop the PBL approach. Considered in this way, we suggest that, while the changes have been successful so far, a failure to engage with these current challenges could result in PBL and BPL at Castle View existing only at the structural level (curriculum and tables), which makes it vulnerable.
**School change: where does the physical environment fit?**

As has been discussed, and also shown through the three case studies, change in schools is linked to the physical environment. The existing school space can either support or constrain the achievement of desired change, and investigation of the school community's use and views of the premises can be helpful at the initiation stage of change. As well as revealing where challenges lie, we have argued that the physical space offers a usefully visible and tangible focus for reflection on existing practices and the collaborative development of ideas for change. The case studies demonstrate how, within a change process that includes the physical setting, changes to school space can support both initial innovation and sometimes further development of a new approach, helping to institutionalise the change. However, as suggested by these case studies and amply demonstrated by the history of school design, such alterations of physical space do not always result in wider change in school culture and practices. The question is whether these case studies, explored through Priestley's framework, can help us to understand the reasons for this unevenness of success.

Although the ‘structural conservatism of education institutions’ (Young & Muller 2010: 15) has been noted, much research has shown that change in school that is merely structural will not tend to be sustained. Thus the alteration of school space alone, as often occurred during the 1960s and 70s when open plan schools were built, would not be expected to succeed. In each of the schools discussed above, the school leaders initiating change showed awareness of this tendency: they often spoke explicitly about the need to change teaching or learning culture, and seemed to see the changed space as part of an integrated pedagogical, cultural and organisational whole. We have argued, however, that they were not all equally successful in realising this vision. Considering the process of change using Priestley’s framework has enabled us to understand and explain the success of Open Futures at Southside, the failure of enquiry based learning at Green Hills and the ongoing challenges of BLP and PBL at Castle View.

Our extra contribution to the debate in this area is to argue that change to the physical setting, understood as part of the whole that is the school learning environment, can be particularly powerful. Where the necessary changes to culture and agency, not just structure, occur, then the physical environment appears to be key. Within the change enacted through Open Futures at Southside, the centrality of the physical environment through the stages of development is notable. It might seem ironic that the physical space, as the most obvious of school structures, is the key to moving beyond mere structural change but the physical learning environment is uniquely visible and tangible - a manifestation of a school’s values and the teachers’ pedagogic approaches.

For further clues as to how school space can support and enable change through bringing people together and focusing combined efforts, we finish with a final look at Open Futures. As described above in the case of Southside, the programme has some clear initial requirements for physical changes to be made, most specifically for the growit and cookit strands. Once complete these spaces facilitate early curricular and pedagogic developments, but also enable progress towards further integration within the strands and with the existing curriculum. In addition, these spaces provide a tangible reminder of new intentions and values: in finding classroom space for filmit, the Southside head signalled her belief in this as valuable learning as well as providing a base for the strand. As the head teacher of a school that had been recruited in an earlier wave of Open Futures summed up their sustained involvement:

> If you’ve got that infrastructure, you can use it and you want to use it don’t you? (Head teacher, School A)
References


